

AMENDMENTS OF THE CLAIMS

Cancel Claims 4 and 9 without prejudice. Please accept amended Claims 1-3, 7-8, 10, and 11 and new Claims 12-13 as follows.

Listing of claims:

1. (Currently Amended) A method for handling Session Initiation Protocol ("SIP") messages for voice over Internet Packet call control, comprising:
receiving a stream of SIP messages;
classifying each of the SIP messages based on as one of at least two message types;
placing said SIP messages in separate queues associated to the message types; ~~and~~
allocating SIP call control server processing resources to each queue according to a pre-defined policy associated with ~~a corresponding the message type types~~, wherein the step of allocating SIP call control server processing resources comprises allocating ~~varying degrees a percentage of the SIP call control~~ server processing resources to ~~individual each of the queues of SIP messages by using a token bucket rate control for processing individual queues ; and~~
leaking the messages from at least one of the queues for enforcing a message overload protection for the associated message type.

2. (Currently Amended) The method of claim 1, wherein the step of classifying each of the SIP messages comprises classifying the messages as a REGISTER, INVITE, or RE-INVITE message.

3. (Currently Amended) The method of claim 2, wherein the step of classifying each of the SIP messages comprises classifying a message as an emergency call message by reading the destination address of a SIP INVITE message.

4. (Canceled)

5. (Currently Amended) The method of claim 1, wherein the step of allocating the SIP call control server processing resources comprises controlling a rate at which messages from individual users are processed by a call control server, thereby preventing denial-of-service attacks on the call control server by individual servers in a packet-based VoIP infrastructure.

6. (Currently Amended) A signal-bearing medium tangibly embodying a program of machine-readable instructions executable by a digital processing apparatus to perform a method for handling Session Initiation Protocol ("SIP") messages for voice over Internet Packet call control, said method comprising:

receiving a stream of SIP messages;
classifying each of the SIP messages based on as one of at least two message types;
placing said SIP messages in separate queues associated to the message types; ~~and~~
allocating SIP call control server processing resources to each queue according to a pre-defined policy associated with ~~a corresponding~~ the message type types, wherein the step of allocating SIP call control server processing resources comprises allocating ~~varying degrees a percentage of the SIP call control~~ server processing resources to ~~individual~~ each of the queues of ~~SIP messages by using a token-bucket rate control for processing individual queues ; and~~
leaking the messages from at least one of the queues for enforcing a message overload protection for the associated message type.

7. (Currently Amended) The medium of claim 6, wherein the step of classifying each of the SIP messages comprises classifying the messages as a REGISTER, INVITE, or RE-INVITE message.

8. (Currently Amended) The medium of claim 7, wherein the step of classifying each of the SIP messages comprises classifying a message as an emergency call message by reading the destination address of a SIP INVITE message.

9. (Canceled)

10. (Currently Amended) The medium of claim 6, wherein the step of allocating the SIP call control server processing resources comprises controlling a rate at which messages from individual users are processed by a call control server, thereby preventing denial-of-service attacks on the call control server by individual servers in a packet-based VoIP infrastructure.

11. (Currently Amended) A system for handling Session Initiation Protocol ("SIP") messages for voice over Internet Packet call control, comprising:

a classifier for receiving a stream of SIP messages and classifying the messages ~~based on~~
as one of at least two message types;

a plurality of queues associated to the message types, wherein the messages are placed in one of the plurality of queues according to a classification of the message and leaked from at least one of the queues for enforcing a message overload protection for the associated message type;

a ~~SIP control server~~ controller for directing calls corresponding to the messages ~~and waiting to be served in the queues~~, wherein the controller comprises a plurality of threads of the messages retrieved from the plurality of buckets running on a processor of the system, wherein each of the plurality of threads corresponds to a respective one of the plurality of queues; and

a scheduler for allocating SIP call control server processing resources to each queue according to a pre-defined policy associated with a corresponding message type, wherein the queues are allocated ~~varying degrees~~ a percentage of the SIP call control server processing resources, and the scheduler schedules the threads corresponding for execution by the processor according to the pre-defined policy ~~using a token-bucket rate control for processing the messages~~.

12. (New) The method of claim 1, further comprising running a plurality of threads of the messages on a processor, wherein each thread corresponds to a respective one of the queues, wherein the allocation of SIP call control server processing resources to each queue according to the pre-defined policy further comprises scheduling the threads for execution according to a scheduling policy.

13. (New) The medium of claim 1, further comprising running a plurality of threads of the messages on a processor, wherein each thread corresponds to a respective one of the queues, wherein the allocation of SIP call control server processing resources to each queue according to the pre-defined policy further comprises scheduling the threads for execution according to a scheduling policy.